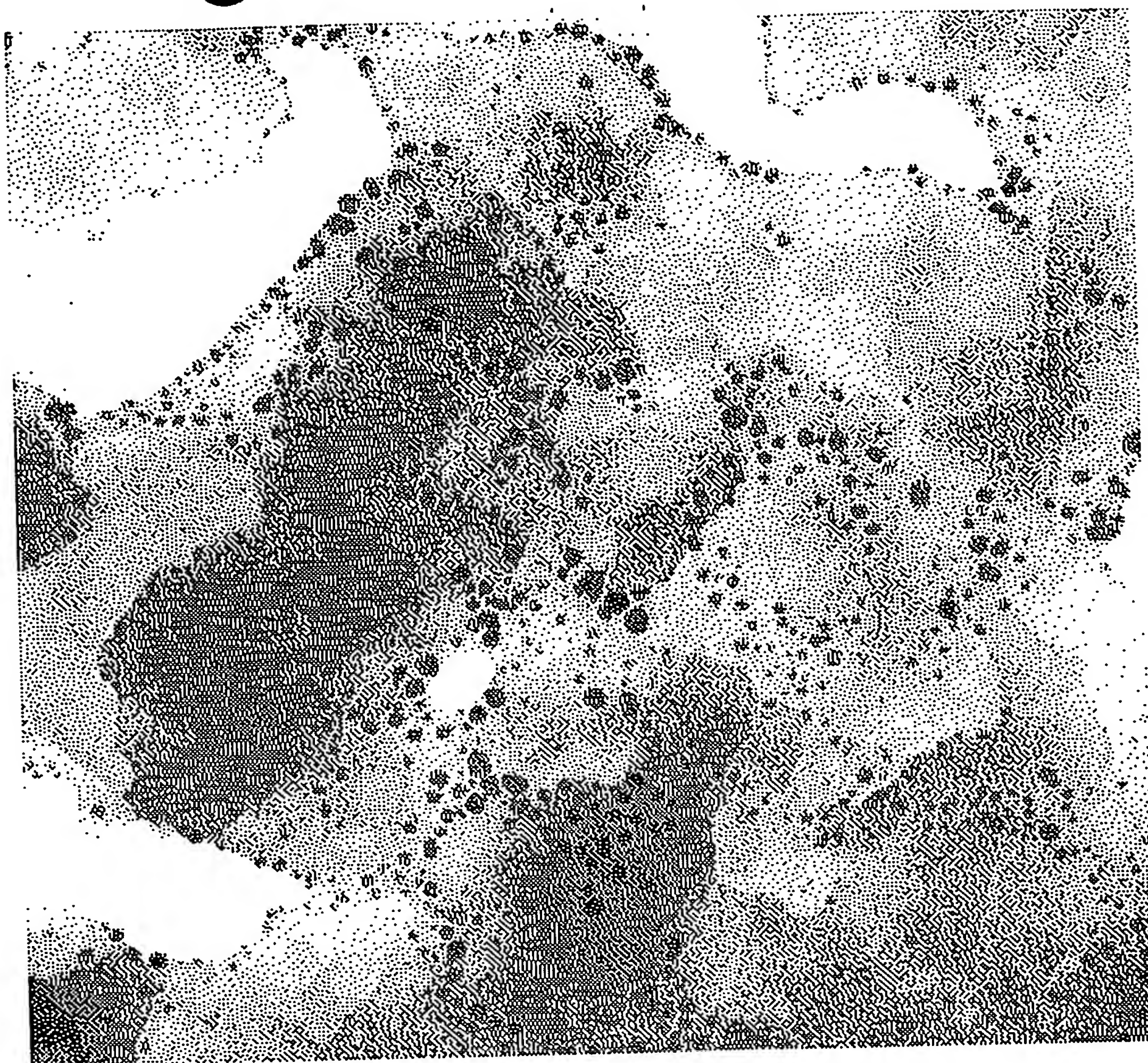
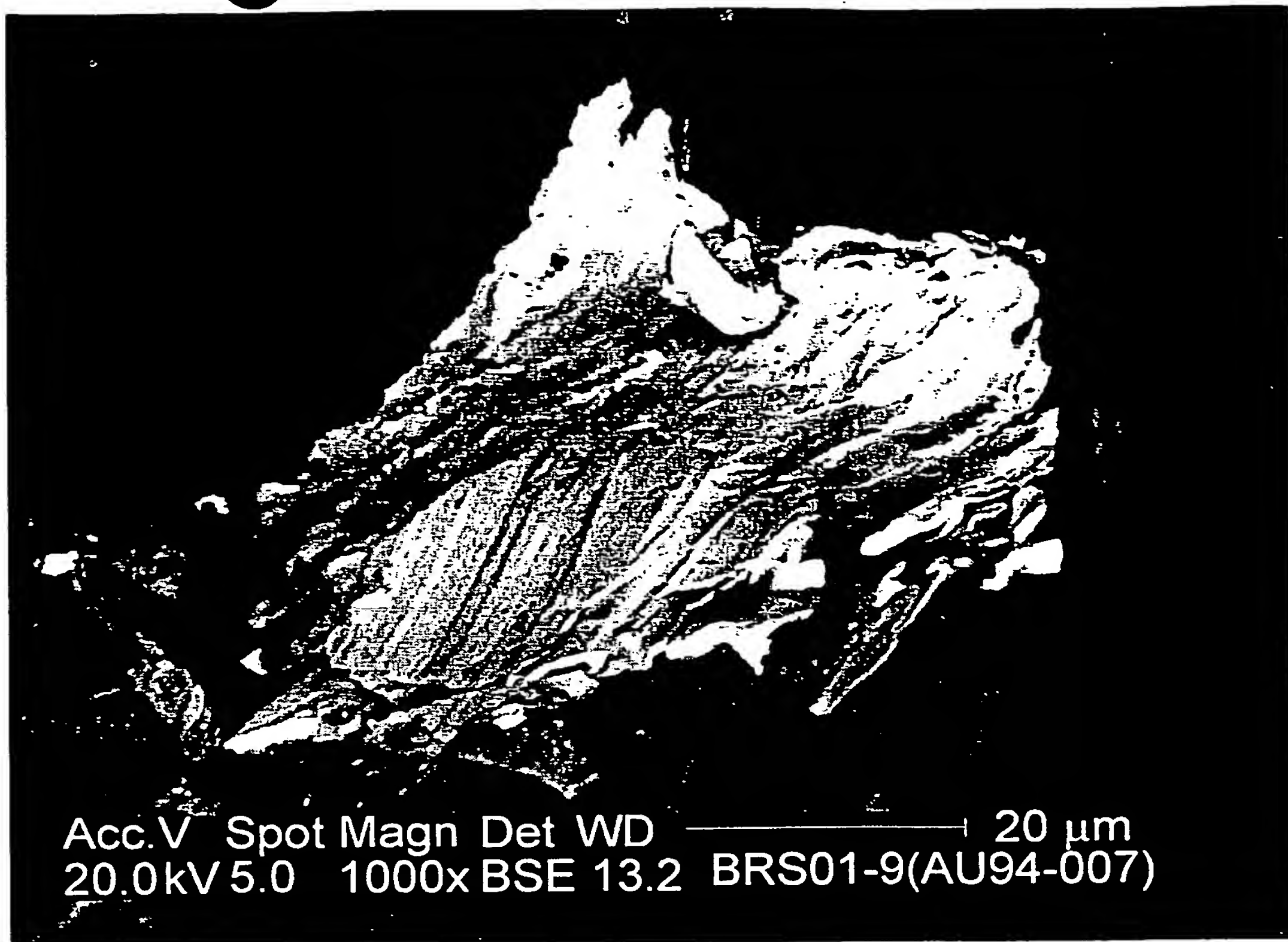


FOOTNOTES





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Table 1

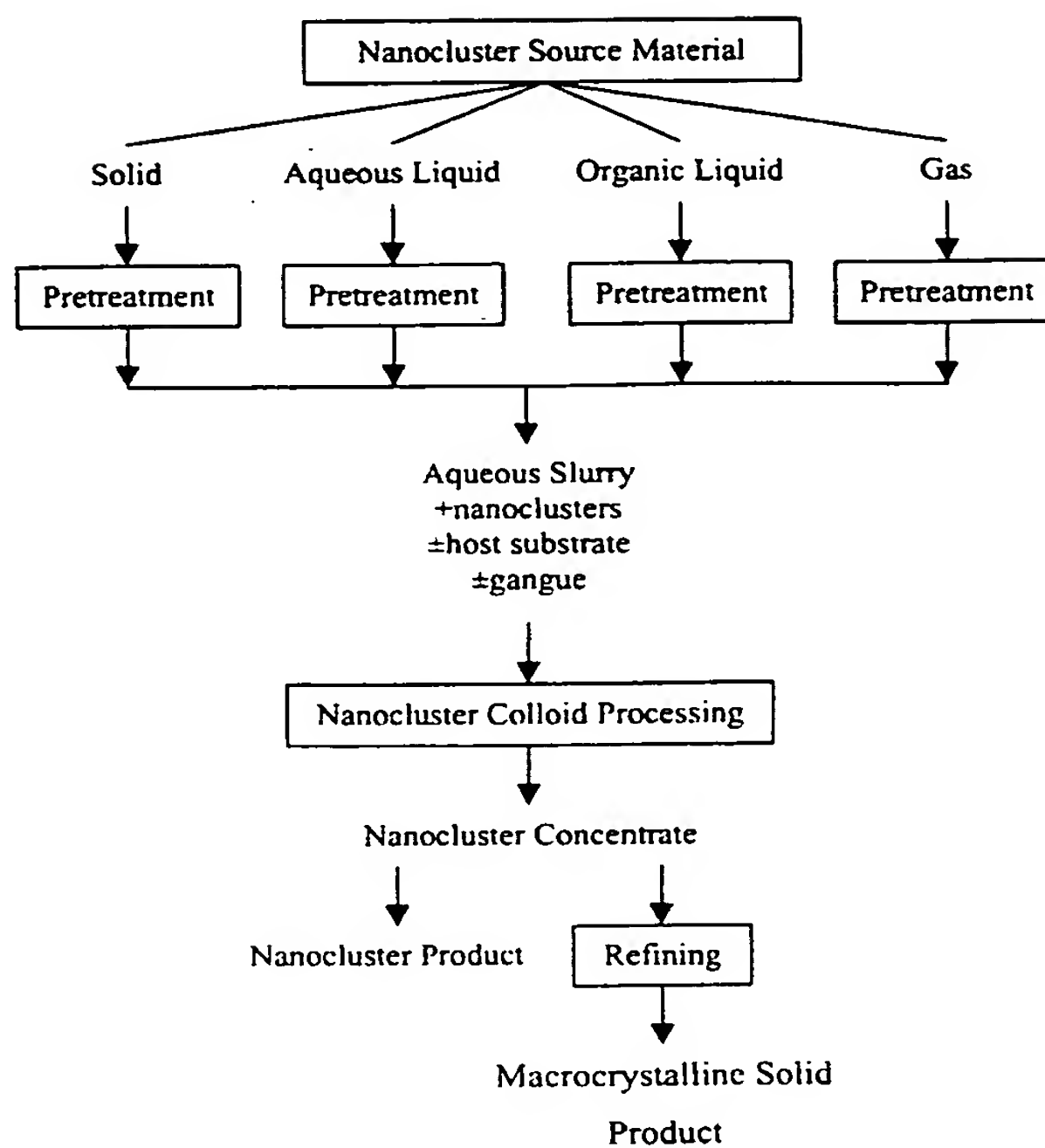


Figure 4. A flow process diagram of pretreatment processes, in accordance with the invention. Explanation: horizontal arrows indicate process; **OP** indicates optional process; underlined indicates material or process product; a downward pointing vertical arrow indicates process products that are advanced to subsequent processing step.

4A. SOLID NANOCLUSTER SOURCE MATERIAL

→ **OP: PREVENT FROM DRYING**

→ **CRUSH**

→ **MILLING**

↓ NANOCLUSTERS + HOST SUBSTRATE + GANGUE ± WATER

→ **SLURRY**

⇒ **TO NANOCLUSTER COLLOID PROCESSING**

4B. AQUEOUS LIQUID NANOCLUSTER SOURCE MATERIAL

→ **OP: PREVENT FROM DRYING**

⇒ **OP: TO NANOCLUSTER COLLOID PROCESSING**

→ **PHASE SEPARATION**

- WATER: to water treatment or recycle

↓ NANOCLUSTERS ± HOST-SUBSTRATE ± GANGUE

→ **SLURRY**

⇒ **TO NANOCLUSTER COLLOID PROCESSING**

Figure 4. Continued.

4C. ORGANIC LIQUID NANOCLUSTER SOURCE MATERIAL

→ OP: PREVENT FROM DRYING

→ PHASE SEPARATION

- WATER: to aqueous liquid pretreatment, water treatment or recycle

↓ ORGANIC LIQUID + NANOCLUSTERS ± HOST-SUBSTRATE

→ PHASE SEPARATION

- ORGANIC LIQUID: to hydrocarbon processing

↓ NANOCLUSTERS ± HOST-SUBSTRATE ± GANGUE

→ SLURRY

⇒ TO NANOCLUSTER COLLOID PROCESSING

4D. GASEOUS NANOCLUSTER SOURCE MATERIAL

→ CONDENSOR

→ SCRUBBER(S)

- GAS: to gas processing

↓ WATER + NANOCLUSTERS ± HOST-SUBSTRATE

⇒ OP: TO NANOCLUSTER COLLOID PROCESSING

→ PHASE SEPARATION

- WATER: to water treatment or recycle

↓ NANOCLUSTERS ± HOST-SUBSTRATE

→ SLURRY

⇒ TO NANOCLUSTER COLLOID PROCESSING

Figure 5. A flow process diagram for nanocluster colloid processing, in accordance with an embodiment of the invention.

- NANOCLUSTERS ± HOST SUBSTRATE ± GANGUE ± WATER (from pretreatment)
 - OP: SLURRY CONDITIONING
 - OP: PHASE SEPARATION
 - WATER: to water treatment or recycle
 - ↓ ORGANIC LIQUID + NANOCLUSTERS ± HOST-SUBSTRATE
 - COLLOID REGENERATION
 - GEL HYDRATION
 - COLLOID PEPTIZATION
 - OP: HEAT & PRESSURE TREATMENT
 - DISPERSION
 - NANOCLUSTER COLLOID DESORPTION
 - PHASE SEPARATION
 - DEPLETED HOST SUBSTRATE + GANGUE: to recycle or tailings
 - ↓ AQUEOUS NANOCLUSTER COLLOID SOLUTION
 - NANOCLUSTER COLLOID RECOVERY
 - PHASE SEPARATION, or
 - ADSORPTION
 - WATER: to water treatment or recycle
 - ↓ NANOCLUSTER CONCENTRATE
 - OP: REFINE
 - ↓ MACROCRYSTALLINE SOLID PRODUCT

A black and white photograph showing a long, dark, irregularly shaped object, possibly a piece of wood or a biological specimen, lying horizontally. The object has a rough, textured surface and is set against a light, grainy background. The lighting is even, highlighting the object's form and texture.

FIGURE 6